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EXAMINER
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MARCHESCHI, MICHAEL A

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



# Office Action Summary

Application No.

10/627,442

Applicant(s)

SUNG, CHIEN-MIN

Examiner

Michael A Marcheschi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 21-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). -  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/9/03, 12/29/03.
- ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.



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Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-20, drawn to abrasive tool, classified in class 51, subclass 307.
- II. Claims 21-30, drawn to a method, classified in class 264, subclass 319.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product, as claimed can be made by a method which involves infiltrating the mass.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Erik Erickson on 3/17/05 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-30 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP §



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**821.04. Process claims that depend from or otherwise include all the limitations of the patentable product** will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103, and 112. Until an elected product claim is found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See "Guidance on Treatment of Product and Process Claims in light of In re Ochiai, In re Brouwer and 35 U.S.C. § 103(b)," 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

The disclosure is objected to because of the following informalities:

The disclosure is objected to as to the limitation set forth on page 2, lines 8-10, page 3, lines 27-29, page 8, lines 24-27 and the abstract (the mass contains greater than 95% by volume nanodiamond and greater than 98% by volume carbon) because the total volume percent is greater than 100%. In addition, since carbon does not necessarily imply diamond (carbon can exist in many forms (i.e. graphite, etc.), how can the mass be at least 98 volume percent carbon. The way the description is drafted is confusing because the limitation "greater than 98% by volume carbon" reads on a mass that comprises 98 volume percent graphite, which is clearly not intended. Is the carbon defined in this description diamond or can other forms of carbon be present. If other forms are present, how can they constitute the high percentage defined. The



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above passages are not drafted in a clear and concise manner as to enable complete understanding of the description. Are other carbon forms (graphite, etc.) present in the mass in addition to the diamond? If so, the description should properly define this and full support for any amendment including this limitation be **defined** in the remarks section of the amendment.

Appropriate correction is required.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because the total volume percent is greater than 100%. In addition, since carbon does not necessary imply diamond (carbon can exist in many forms (i.e. graphite, etc.), how can the mass be at least 98 volume percent carbon. The way the claim is drafted is confusing because the limitation "greater than 98% by volume carbon) reads on a mass that comprises 98 volume percent graphite, which is clearly not intended. Is the carbon defined in the claim, diamond or can other forms of carbon be present. If other forms are present, how can they constitute the high percentage defined by the claim. This claim is not drafted in a clear and concise manner as to enable complete understanding of the claimed invention. Are other carbon forms (graphite, etc.) present in the mass in addition to the diamond? If so, the claim should properly define this and full support for any amendment including this limitation be **defined** in the remarks section of the amendment.

Claim 5 is indefinite since carbon does not necessary imply diamond (carbon can exist in many forms (i.e. graphite, etc.), how can the mass consists of carbon (i.e. other forms of carbon



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broadly encompassed by the limitation carbon). The way the claim is drafted is confusing because the limitation "consists of carbon" reads on a mass that consists of graphite, which is clearly not intended because in claim 1 diamond is present. Is the carbon defined in the claim diamond or can other forms of carbon be present. If other forms are present, how can they constitute all of the mass. This claim is not drafted in a clear and concise manner as to enable complete understanding of the claimed invention. If so, the claim should properly define this and full support for any amendment including this limitation be **defined** in the remarks section of the amendment.

Claim 15 is indefinite because it is outside the scope of claim 11. Claim 11 requires that the substrate comprise a diamond layer but claim 15 state that the substrate is a material other than diamond. If the examiner is in error with respect to what claim 12 is defining, applicants are requested to rewrite claim 12 to clearly define what is intended.

Claims 18-20 are indefinite because they recite a tool as being a heat spreader, a surface acoustical wave filter or a radiation window. These 3 devices are not tools per se because a tool implies a cutting device. In addition, it is apparent that the 3 devices require other essential limitations to define the specific devices not specifically defined in the claims. In other words, how can a nanodiamond material define a heat spreader, a surface acoustical wave filter and a radiation window without the inclusion of other essential device limitations. If applicant rewrites the claims in independent form as claiming the device or in a form other than a tool, the claims would be non elected by original presentation. In view of this, it is suggested that these claims be canceled.



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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**For the purpose of the rejections below, the examiner is interpreting carbon to mean diamond.**

Claims 1-11 and 15-20 are rejected under 35 U.S.C. 103(a) as obvious over Cerutti.

Cerutti teaches in the abstract, column 3, line 59-column 4, line 5, column 7, line 60-column 8, line 5 and the claims, a diamond compact which is attached to a carbide substrate to form a tool, said diamond compact comprising a sintered mass of diamond particles having a submicron size. It is stated that a catalyst is **optionally** added.

With respect to the volume percent of the diamond in the mass, although the reference might use (in some cases) a catalyst, this is an optional component, and thus it is the examiners position that absent the catalyst for diamond, the mass can be 100 percent diamond (self sintered) and broadly occupy more than 98 volume percent of the mass absent evidence to the contrary.. In other words, the limitation diamond and “**optionally** a catalyst” when used in the method implies that the mass is 100% diamond because the catalyst does not have to be present. With respect to the size, the reference teaches a submicron size and this encompasses and therefore



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makes obvious the claimed nanometer size because the reference overlaps the claimed range.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.



Claims 1-10 and 16-20 are rejected under 35 U.S.C. 103(a) as obvious over Akashi et al.

Akashi et al. teaches in the abstract, column 3, lines 57-59, column 8, lines 49-50 and the claims, a diamond compact (tool), said diamond compact comprising a sintered mass of diamond particles having a submicron size. It is stated that additives (transition metals) are optionally added.

With respect to the volume percent of the diamond in the mass, although the reference might use (in some cases) a catalyst, this is an optional component, and thus it is the examiners position that absent the additive for diamond, the mass can be 100 percent diamond (self sintered) and broadly occupy more than 98 volume percent of the mass absent evidence to the contrary. In other words, the limitation diamond and “without additives” when used in the method implies that the mass is 100% diamond because the catalyst does not have to be present. In addition, column 8, line 50 states that the diamond structure is preserved. With respect to the size, the reference teaches a submicron size and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). Although this might be the size of the starting material, it is the examiner position that during processing the size of the diamond (crystallites, etc.) will not substantially vary from the initial size absent evidence to the contrary (i.e. the size of the particles in the sintered mass



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**will be substantially the same).** With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as obvious over Akashi et al., applied to claim 1 above and in view of Cerutti

Akashi et al. states that the diamond compact can be a cutting tool and as is well known from the secondary reference, cutting tool based on diamond compacts are known to include a



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substrate attached to said compact. In view of this, it is the examiners position that the claimed limitations are obvious because the use of a substrate to make a diamond tool is well within the level of ordinary skill in the art.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as obvious over Phaal et al.

Phaal et al. teach in the abstract, column 2, line 66-column 3, line 2 and the claims, a diamond compact which is attached to a carbide substrate to form a tool, said diamond compact comprising a sintered mass comprising at least 70% by volume diamond particles having a submicron size (i.e. recitation of less than 75 microns implies submicron sized particles). The above sintered mass is attached to a carbide substrate by layer that comprises ultra hard particle (diamond particles) having a coarser size (i.e. exemplified as 100 microns, although other sizes are obvious from the broad disclosure) than the abrasive in the above mass. It is stated in column 2, lines 56-65 that the mass and layer may also contain a second phase (i.e. cobalt, etc.).

With respect to the volume percent of the diamond in the mass, the reference states that the mass comprises at least 70% diamond and this broadly reads on claim 1 because at least includes 98%. Although a preferred vol. percent is defined, the reference is not limited to this because "A reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421. With respect to the limitation of "consist of carbon (diamond)" (claim 5) the reference states that a catalyst may be added and the term "may" implies that this is an optional component (the term "may" does not definitely define that the catalyst is present), and thus it is the examiners position that absent the catalyst for diamond, the mass can be 100 percent diamond. In other words, the



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limitation diamond and “may also contain a catalyst” when used in the method implies that the mass is 100% diamond because the catalyst does not have to be present. In addition, as can be seen from claim 1 of the reference no catalyst is present. With respect to the size, the reference teaches a submicron size (i.e. recitation of less than 75 microns implies submicron sized particles) and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claims 12-14, the references teaches a tool, wherein the diamond mass is attached to a carbide substrate using a diamond layer comprising coarser sized diamond particles than present in the diamond mass. In addition, this layer can also comprises a catalyst. In view of this the above limitations are met because the structure of the tool is the same. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the



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article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims to define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as obvious over Hall et al.

Hall et al. teach in the abstract, column 3, line 60-column 4, line 68, column 6, line 10-column 7, line 27, the claims and figure 2, a diamond compact which is attached to a carbide substrate to form a tool, said diamond compact comprising a top layer, a transition layer and a substrate attached to the transition layer. The top layer comprises a sintered mass comprising 100 volume percent diamond having a fine size (0 to 5 microns) and the transition layer comprises diamond particle that **can** have a size of having a size of 1-100 microns and a catalyst.

With respect to the volume percent of the diamond in the mass, the reference states that the mass (first layer) comprises 100 volume percent thus reading on claim 1. Since the layer can be only diamond (as can be seen from claim 1 of the reference no catalyst is present), the limitation of claim 5 is met.. Although this percent might be for the working surface, the instant independent claim makes no mention of if the percent defined is for the entire mass or for a



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specific part of the mass. In view of the absence of such limitation, the broad interpretation of the claim is that the volume percent can be for the surface only. Assuming persuasive *arguendo* about this, the reference clearly teaches in claim 12 that the mass comprises 98 volume percent diamond, thus reading on claim 1. In addition, as can be seen from claim 1 of the reference no catalyst is present in the first layer (mass), thus absent a catalyst, the mass can be 100 volume percent diamond absent evidence to the contrary. With respect to the size, the reference teaches a submicron size (i.e. recitation of 0 to 5 microns implies submicron sized particles) because a size of 0 microns reads on 0.0001 micron, etc. and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). **In addition, the reference states that the size can be varied according to the particular application.** In view of this, the size is also obvious depending on the application desired. One skilled in the art would have known the optimum size required through routine experimentation and optimization. With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary **and** evidence that the reference mass does not have this feature. With respect to the limitation of claims 12-14, the references teaches a tool, wherein the diamond mass is attached to a carbide substrate using a diamond layer comprising coarser sized diamond particles (1-100 microns) than present in the diamond mass. In addition,



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this layer can also comprises a catalyst. In view of this the above limitations are met because the structure of the tool is the same. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as obvious over Wentorf, Jr. et al.

Wentorf, Jr. et al. teach in the abstract, column 4, lines 8-68, column 5, line 49-column 6, line 14, the claims and figure 2, a diamond compact which is attached to a carbide substrate to form a tool, said diamond compact comprising a top layer, a transition layer and a substrate attached to the transition layer. The top layer comprises a sintered mass comprising 99+ volume



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percent diamond having a fine size (i.e. about 0.1 microns or about 100 nm) and the transition layer comprises diamond particle that **can** have a size of having a size of 0.1-100 microns and a catalyst.

With respect to the volume percent of the diamond in the mass, the reference states that the mass (first layer) comprises 99+ volume percent thus reading on claim 1. In addition, as can be seen from claim 1 of the reference no catalyst is present, thus reading on claim 5 (mass consists of diamond). With respect to the size, the reference teaches a submicron size (about 100 nm to micron size) and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claims 12-14, the references teaches a tool, wherein the diamond mass is attached to a carbide substrate using a diamond layer can comprising coarser sized diamond particles (1-100 microns) than present in the diamond mass. In addition, this layer can also comprises a catalyst. In view of this the above limitations are met because the structure of the tool is the same. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same,



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it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 1-4, 6-11 and 15-20 are rejected under 35 U.S.C. 103(a) as obvious over Nakai et al.

Nakai et al. teach in the abstract, column 2, lines 40-68, column 5, lines 28-50, column 12, lines 40-44, column 13, lines 23-30 and the claims, a diamond compact which is attached to a carbide substrate to form a tool, said diamond compact comprising a sintered mass of diamond which comprises 20-85 volume percent large diamond grains and the balance being 95 volume % of ultrafine diamond (less than 1 micron) and a substrate attached to the mass.

With respect to the volume percent of the diamond in the mass, the reference states that the mass comprises 95 volume percent thus broadly making the claimed amount of about 98



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volume percent carbon obvious because "about" **permits some tolerance**, *In re Ayers*, 154 F 2d 182, 69 USPQ 109. With respect to the size, the reference teaches a submicron size (less than 1 micron) and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary **and** evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used **in** the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave



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filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 1-10 and 16-20 are rejected under 35 U.S.C. 103(a) as obvious over JP 2-30667.

The JP reference teaches in the entire document, specifically the section relating to the abstract, claims and effects of the invention, a diamond compact (tool), said diamond compact which comprises 5-95 volume percent large diamond grains and 95 volume % of ultrafine diamond (10-100 nm) and a substrate attached to the mass.

With respect to the volume percent of the diamond in the mass, the reference states that the mass comprises 95 volume percent thus broadly making the claimed amount of about 98 volume percent carbon obvious because "about" **permits some tolerance**, *In re Ayers*, 154 F.2d 182, 69 USPQ 109. With respect to the size, the reference clearly teaches this. With respect to the limitation of claim 5, no other material (no catalyst) is present in the mass, thus the mass consists of diamond. With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absent evidence to the contrary **and** evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a



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catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as obvious over JP 2-30667, applied to claim 1 above and in view of Cerutti

The JP reference states that the diamond compact can be a cutting tool and as is well known from the secondary reference, cutting tool based on diamond compacts are known to include a substrate attached to said compact. In view of this, it is the examiners position that the claimed limitations are obvious because the use of a substrate to make a diamond tool is well within the level of ordinary skill in the art.

Claims 1-4, 6-10 and 16-20 are rejected under 35 U.S.C. 103(a) as obvious over Sumiya (217).



Sumiya et al (217) teach in the abstract, column 1, lines 13-14, column 13, lines 18-30 and the claims, a diamond compact which is applied to tool materials, said diamond compact comprising a sintered mass of diamond particles in a vol. percent 50-99.9, said particles can have a submicron size (10 nm+).

With respect to the volume percent of the diamond in the mass, this is clearly defined. With respect to the size, the reference teaches a submicron size and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the



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contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as obvious over Sumiya et al. (217), applied to claim 1 above and in view of Cerutti

The primary reference states that the diamond compact can be a cutting tool and as is well known from the secondary reference, cutting tool based on diamond compacts are known to include a substrate attached to said compact. In view of this, it is the examiners position that the claimed limitations are obvious because the use of a substrate to make a diamond tool is well within the level of ordinary skill in the art.

Claims 1-11 and 15-20 are rejected under 35 U.S.C. 103(a) as obvious over Yoshida et al..

Yoshida et al. teach in the abstract and column 3, lines 4-15, a diamond compact which is applied to substrate top form a tool, said diamond compact comprising a sintered mass of diamond particles in a vol. percent 85-99, said particles can have a submicron size (100 nm).

The mass consists of diamond grains.



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With respect to the volume percent of the diamond in the mass, this is clearly defined.

With respect to the size, the reference teaches a submicron size and this encompasses and therefore makes obvious the claimed nanometer size because the reference overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976). With respect to the limitation of claim 10, it is the examiners position that absent evidence to the contrary, no recitation of particle orientation, makes obvious random oriented particles absence evidence to the contrary and evidence that the reference mass does not have this feature. With respect to the limitation of claim 16, it is the examiners position that the reference tool meets this criteria because this is a function of the tool composition and since the composition is the same, it can be expected to have the same characteristic absent evidence to the contrary. With respect to the limitation of claim 18, it is the examiners position that when a catalyst is used (material that can transmit heat) it can be considered a heat spreader. In addition, irrespective of what the article is called, the article is still the same (same diamond mass and interstitial material) and thus no patentable distinction is seen to exist. Finally, since the article is the same (has the same components), it can function as a heat spreader absent evidence to the contrary. With respect to claims 19-20, in view of the indefinite rejections above, the examiner is interpreting the claims do define that the sintered mass is used in the claimed applications. In view of this interpretation, since the article is the same (has the same components), it can function as a component of an acoustical wave filter and a component of a radiation window



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absent evidence to the contrary. With respect to the claims not defined above, the limitations of these claims are either explicitly taught or suggested by the reference.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as obvious over *either* (1) Cerutti as applied to claim 11 above, (2) Akashi et al. in view of Cerutti as applied to claim 11 above, (3) JP 2-30667 in view of Cerutti as applied to claim 11 above, (4) Sumiya et al. (217) in view of Cerutti as applied to claim 11 above or (5) Yoshida et al. as applied to claim 11 above all in view of Phaal et al. and Wentorf, Jr. et al.

Phaal et al. teaches in claim 1 that diamond masses are known to be attached to a carbide support by way of a diamond/catalyst layer (coarser sized diamonds than in the mass).

Wentorf, Jr et al. et al. teach in column 4, lines 44-46 that diamond masses are known to be attached to a carbide support by way of a diamond/catalyst layer (can coarser sized diamonds than in the mass) in order to minimize the stress concentration.

It is the examiners position that in the articles according to the primary reference stress gradients are apparent between the mass and the substrate and therefore it is the examiners position that one skilled in the art would have found the use of any teaching obvious to minimize the above stress gradients. Since the secondary references teach how this stress can be minimized, the use of any teaching to minimize the stresses is well within the level of ordinary skill in the art.

In view of the teachings as set forth above, it is the examiners position that the references reasonably teach or suggest the limitations of the rejected claims.



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A reference is good not only for what it teaches but also for what one of ordinary skill might reasonably infer from the teachings. *In re Opprecht* 12 USPQ 2d 1235, 1236 (CAFC 1989); *In re Bode* USPQ 12; *In re Lamberti* 192 USPQ 278; *In re Bozek* 163 USPQ 545, 549 (CCPA 1969); *In re Van Mater* 144 USPQ 421; *In re Jacoby* 135 USPQ 317; *In re LeGrice* 133 USPQ 365; *In re Preda* 159 USPQ 342 (CCPA 1968). In addition, "A reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421.

A generic disclosure renders a claimed species prima facie obvious. *Ex parte George* 21 USPQ 2d 1057, 1060 (BPAI 1991); *In re Woodruff* 16 USPQ 2d 1934; *Merk & Co. v. Biocraft Lab. Inc.* 10 USPQ 2d 1843 (Fed. Cir. 1983); *In re Susi* 169 USPQ 423 (CCPA 1971).

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976).

The change in sequence of adding ingredients would have been obvious to one of ordinary skill in the art absent evidence to the contrary. *In re Gibson* 5 USPQ 230.

Applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.



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Evidence of unexpected results must be clear and convincing. *In re Lohr* 137 USPQ 548.

Evidence of unexpected results must be commensurate in scope with the subject matter claimed.

*In re Linder* 173 USPQ 356.

The additional references on the 892 have been cited as art of interest since they are cumulative to or less than the art relied upon in the rejections above.

The additional references cited on the 1449 have been reviewed by the examiner and are considered to be art of interest since they are cumulative to or less than the art relied upon in the above rejections.

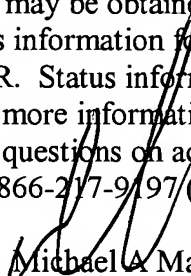
Any foreign language documents submitted by applicant has been considered to the extent of the short explanation of significance, English abstract or English equivalent, if appropriate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A Marcheschi whose telephone number is (571) 272-1374. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3/05  
MM

  
Michael A Marcheschi  
Primary Examiner  
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